REMARKS

This Amendment is responsive to the Office Action mailed on December 30, 2009. Claims 44-46, 50, 51, and 86 are amended. Claims 84, 88, and 89 are cancelled. New claims 90-93 are added. Claims 40, 41, 43-82, 85-86, and 90-93 are pending.

Claim 82 is allowed.

The Examiner has rejected claims 84, 88, and 89 under 35 U.S.C. §112 as being indefinite, as the term "immediately changed" is deemed to be unclear. Claims 84, 88, and 89 are cancelled and withdrawal this rejection is respectfully requested.

Claims 40, 41, 43-81, 84-86, 88 and 89 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Thrash (US 5,801,914) in view of Saito (US 6,243,018).

Applicants respectfully traverse these rejections in view of the amended claims and the following comments.

Discussion of Amended Claims

Claim 44 is amended to clarify that the detector line surrounds the supply line in the form of a helix.

Claim 45 is amended to clarify that the detector line surrounds the supply line in the form of meanders.

Claim 46 is amended to include the subject matter of claims 44 and 45 in the alternative.

Claims 50 and 51 are amended to clarify that the detector line is applied as a layer.

Claim 86 is amended to clarify that the carrier strip irreversibly changes its shape.

Claims 84, 88, and 89 are cancelled.

New claim 90 is based on a combination of claims 86 and 44 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

New claim 91 is based on a combination of claims 86 and 45 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

New claim 92 is based on a combination of claims 86, 44 and 46 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

New claim 93 is based on a combination of claims 86, 45, and 46 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

Discussion of Rejections of Claim 40

Thrash and Saito are discussed in detail in Applicants' prior filed Amendments and Responses. The Examiner continues to equate the detection of a serial arc as disclosed in Thrash with the detection of a parallel arc, irrespective of its direction, as is the case with Applicants' claimed invention. Contrary to the Examiner's assertions, with the design disclosed in Thrash a parallel arc cannot occur, due to the very different structures of the respective line arrangements of Thrash and that claimed by Applicants. The line arrangement used by Thrash is a specific line in which both conductors 28 and 30 are connected by a PTC resistor and further both conductors 28 and 30 are connected at their ends as described in detail in Great Britain patent GB 2 168 580 A (referenced at Col. 6, line 50 of Thrash) which has the specific stated advantage that a single break of one of conductors 28 and 30 does not result in the creation of an arc. The basic line arrangement used by Thrash is explained in detail in column 6, lines 41 to 53 with explicit reference to GB 2 168 580 A. As explained in detail in GB 2 168 580 A, a single break does not lead to a voltage drop sufficient to cause an arc (see, e.g., Page 1, lines 82-127 of GB 2 168 580 A).

Thus, in the design of Thrash, there can only occur a serial arc and as described in Thrash at column 6, lines 54, et seq., and only in the case where two breaks occur in either conductor 28

or 30 the voltage drop across one or both breaks is usually so significant that the creation of a serial electrical arc results between the two broken ends of the same wire. In Thrash, such a serial arc can generate excessive heat which if the operating power is not discontinued can create a hazardous situation by burning PTC material 26, insulating coating 32 and ultimately the fabric of the blanket. However, it is also stated in column 6, lines 62, et seq., that conductive fiber 34 of the safety circuit of the invention of Thrash prevents a hazardous situation from developing when two breaks occur in either conductor 28 or 30. Fiber 34 is in close physical and thermal proximity to conductors 28 or 30 and is formed of material which causes it to sever when exposed to high temperatures. Further it is explained in column 7, lines 1 to 5 of Thrash that the conductive fiber 34 will not break during normal operation but will quickly break if excessive overheating conditions develop such as caused by a serial electrical arc.

Thus, in Thrash, an arc only occurs if there are two breaks in either one of the two conductors 28 and 30 because then only there is a significant voltage drop between the broken ends of the same conductor to start a arc and such an arc clearly is a serial arc between these two broken ends.

There is no indication that any arcs other than a serial arc can occur in the arrangement of Thrash. In particular, there is not the slightest indication that a parallel arc might occur with the design of Thrash since both conductors are enclosed by the PTC material as clearly shown in Fig. 2 so that the PTC material, which is the heating element, guides the current from one conductor 28, 30 to the other conductor 30, 28 so that even in case the outer coating 32 would be damaged no parallel local arc would occur. In fact, it appears that Thrash is specifically designed to prevent the occurrence of parallel arcs (See GB 2 168 580 A).

Further, as disclosed in GB 2 168 580 A, the PTC material is a self-regulating material that increases in local temperatures along the length of the heating element, causing that portion of the heating element to receive less current and thereby reduces the power input to the overheated area (page 1, lines 55-64). This reduction in power further reduces the potential for parallel arcs.

Further, the Examiner's assertion that "Thrash's system includes the electrical system of a vehicle, and therefore meets the limitation of arc to a body component of a vehicle" set forth on page 4 of the Office Action is completely misplaced. It is acknowledged that the portion of Thrash cited by the Examiner which broadens the applicability of the Thrash system would not limit the Thrash system to electric heating blankets and would open the door to apply the Thrash system to a vehicle. However, the Thrash system will still be a "Thrash system" and it will comprise a heating element which is provided with a safety system in order to prevent the problems of a serial arc which appears only in the event that one of the conductors 28 or 30 has a double break. It is respectfully submitted that if one of ordinary skill in the art were somehow motivated to apply Thrash to a motor vehicle, such an application would be limited only to, e.g., heated seats of a vehicle or other types of heating elements. However, only with impermissible hindsight could one of ordinary skill in the art broaden the scope of Thrash to non-heating elements of a vehicle. Further, the Examiner improperly assumes, even in the event that such heating elements could be used in a vehicle, that the heating elements of Thrash would automatically meet the safety needs in a vehicle (i.e., protection from parallel arcs to a body component of a vehicle). Thrash does not explicitly mention application of its system to a vehicle.

Further, one of ordinary skill in the art having common sense at the time of the present invention would not have reasonably considered modifying the electric blanket of Thrash for use in a motor vehicle, as common sense would dictate that such a system as disclosed in Thrash is not suitable for a motor vehicle line arrangement for carrying power from a power source to an electrical device of a vehicle due to the fact that both conductors 28 and 30 of Thrash have their ends connected to each other in order to avoid creation of an arc in the event of a single break. See, Ex Parte Green, Appeal 20071271 (decided June 12, 2007); and Ex Parte Rinkevich et al, Appeal 2007-1317 (decided May 29, 2007).

The Examiner also equates the line connected to switch 18 of Thrash with Applicants' claimed electrical supply line, and PTC material 26 with Applicants' claimed electrical device. The Examiner also asserts that the line connected to switch 18 of Thrash includes conductor 28,

which the Examiner asserts is equivalent to Applicants' claimed at least one current carrying inner conductor (Office Action, page 3). It is respectfully submitted that the line connected to switch 18 of Thrash does not include the conductors 28 and 30 and the conductive fiber 34 all surrounded by the PTC material 26. As discussed at Col. 6, lines 3-6, of Thrash, the conductive fiber 34 of Thrash only runs from point 58 to point 60 of the heating element 12 (Fig. 3). Thus, everything between the plug 24 (current feed terminal) and the connector leading to the heating element 12 (the current delivery terminal) of Thrash may be considered to be the "line arrangement." However, this line arrangement of Thrash does not have a detector element running along the supply line. Contrary to the Examiner's assertions, the entire heating element 12 of Thrash (including the conductors 28 and 30 and the conductive fiber 34, surrounded by the PTC material 26) is equivalent to the load (electrical device) of Applicant's claim 40. Thus, the line running from point 58 to the point between the relay coil 42 and start button 20 of Thrash is not a portion of conductive element of fiber 34, as apparently assumed by the Examiner. Rather, the conductive element 34 of Thrash that the Examiner has equated with Applicants' detector element is only within the heating element 12 and is not present in the line arrangement connecting the power source to the load.

Accordingly, since there is no detector element present in the electrical line arrangement of Thrash, Thrash does not disclose or remotely suggest a detector element embedded within a protective enclosure and with successive windings surrounding the supply line over an extent of the supply line, said detector element being adapted in such a way that at least one of said electrical and optical properties are irreversibly changed when a parallel local arc originating from one of the at least one current-carrying inner conductor to a body component of the vehicle occurs, irrespective of a direction of the parallel local arc, as claimed by Applicants.

It is also respectfully submitted that one of ordinary skill in the art at the time of the present invention would not be motivated to combine the disclosures of Thrash and Saito as suggested by the Examiner. In particular, while it is acknowledged that Saito shows a protective sheath surrounding an inner conductor and that Saito discloses a detector element which runs along

the supply line in successive windings, there is nothing to suggest a combination of this subject matter of Saito with that of Thrash. Even assuming *arguendo* that such motivation can be found, the disclosures of Thrash and Saito are not combinable. As explained in detail above, the system of Thrash is not able to generate a parallel arc. Accordingly, there is no need to modify Thrash with the detector line structure of Saito. Further the detector line of Saito is not a detector line which responds to an arc. Rather, the aim of Saito is to detect a potential change that is due to a short between the detector line and ground or a short between the detector line and the power line. Saito does not disclose or remotely suggest the concept of breaking or interrupting of the detector line due to a parallel arc which may radiate in any direction. Thus, one of ordinary skill in the art would not arrive at Applicants' claimed invention based on a combination of Thrash and Saito.

Further, there is no motivation or suggestion to be found for one or ordinary skill in the art at the time of the present invention to modify Thrash by removing the detector line 34 from the PTC bundle shown in Figure 2 of Thrash and to arrange the arc sensitive detector line 34 disclosed in Thrash around a supply line in the manner in which the potential sensitive detector line of Saito is arranged.

Only with hindsight impermissibly gained from Applicants' disclosure could one of ordinary skill in the art have arrived at the conclusions of the Examiner.

Discussion of Rejection of Claims 44 and 45

Claim 44 is amended to clarify that the detector line surrounds the supply line in the form of a helix. Claim 45 is amended to clarify that the detector line surrounds the supply line in the form of meanders.

In rejecting claims 44 and 45 the Examiner refers to the twisted fibers of Thrash. The conductive fiber 34 of Thrash is, in the embodiment referred to by the Examiner, comprised of stainless steel fibers twisted around a polyester yarn. Thus, the stainless steel fiber of Thrash is twisted around the yarn and runs along the supply lines (conductors 28 and 30 of Thrash) but does not surround the supply line as is claimed by Applicants'

Discussion of Claim 46 Rejection

The Examiner mistakenly interprets claim 46 as referring to the distance between the detector and the conductors. For clarity, claim 46 is amended to include the subject matter of claims 44 and 45, namely that the detector line surrounds the supply line in the form of one of meanders or a helix. Thus, the distances defined in claim 46 refer to the distances between adjacent windings of a helix or adjacent portions of meander, which is not disclosed or suggested by Thrash.

Discussion of Claim 50 Rejection

It is respectfully submitted that the Examiner's rejection of claim 50 is improper, as the fact that Thrash discloses a stainless steel fiber twisted around a polyester yarn is not sufficient to disclose a carrier for the detector line because the polyester yarn is not a carrier for the stainless steel fiber.

However, in order to clarify the subject matter of claim 50 and to further distinguish over Thrash, claim 50 is amended to specify that the detector line is in the form of conducting tracks applied as a layer on the carrier.

A twisting of a stainless steel fiber around a polyester yarn as disclosed in Thrash is not equivalent to be a detector line "applied" on a carrier in the form of a conducting track, as is claimed by Applicants in amended claim 50.

Discussion of Claim 81 Rejection

The Examiner is referred to the arguments set forth above with regard to the claim 40 rejection, which apply equally to claim 81.

Discussion of Claim 85 Rejection

With respect to claim 85 the Examiner improperly equates the yarn of Thrash with Applicants' claimed carrier. The yarn of Thrash does not irreversibly deform under the effect of

an arc leading to mechanical stress by actively acting on the detector line, as claimed by Applicants.

In Thrash, as the yarn and the fiber are twisted together, the yarn cannot be considered to be a carrier connected to the detector because the yarn of Thrash is not connected to the fiber. Both yarn and fiber of Thrash are twisted and both are abutting but they are not connected. Since the yarn is not connected to the fiber of Thrash, it is impossible that the yarn provides mechanical stress which actively acts on the detector because there is no connection between the yarn and the stainless steel fiber so both can slide relative to each other.

Further, those of ordinary skill in the art will appreciate that a simple polyester yarn is not able to undergo an irreversible deformation leading to mechanical stress which actively acts on an element adjacent thereto because such a behavior would make it necessary that a pre-treatment has taken place. For example a plastic material can be prepared to irreversibly deform by generating mechanical stress on an other element if the plastic element is provided with an initial form and by a bending process under temperatures close to the melting point brought into a form different from its initial form so that subsequent heating of the material (e.g., in the case of an arc) would initiate a deformation of the element back to the initial form. However there is disclosure or remote suggestion in Thrash about any such pre-treatment of the yarn.

Thrash in combination with Saito does not disclose or remotely suggest a carrier connected to the detector line and consisting of a material which under the local effect of an arc originating from one of the at least one inner conductor irreversibly deforms, leading to mechanical stresses which actively act on the detector line and thus changes said at least one of said optical or electrical properties of said detector line due to the connection of said detector line to said carrier, as claimed by Applicants.

Discussion of Rejection of Claim 86

The arguments set forth above with respect to claim 85 apply to claim 86, which similarly specifies that the carrier strip is connected to the detector track and consists of a material which

under the local effect of an arc originating from one of the at least one inner conductor irreversibly changes its shape, thereby exerting mechanical forces acting directly on the detector track which interrupt said detector track due to the connection of said detector track to said carrier strip.

As discussed above in connection with claim 85, such a behavior of the yarn of Thrash as a carrier could only be achieved if there were a pre-treatment of the yarn so that the yarn after being heated by the occurrence of an arc undergoes the irreversible change in its form or shape to interrupt the detector track connected to the yarn by the yarn exerting mechanical forces.

In addition, as discussed above, stainless steel fibers twisted around yarn is not equivalent to a connection of the stainless steel fiber to the yarn because both can slide along each other and because the yarn without pre-treatment is not able to change its form or shape at the time a local arc occurs.

The foregoing is evident from Thrash as Thrash simply talks about melting away of the yarn due to a melting point of 256°C whereas the stainless steel fiber has a typical melting point at about 1500°C. Further in column 4, lines 54 to 56 of Thrash, the reason for use of the polyester yarn is disclosed and it is explained at the polyester yarn is simply used to add strength to the fiber strands, meaning the overall bundle comprising the yarn and the stainless steel fiber, in order to facilitate the manufacturing process. The difference in melting temperature clearly shows that at the time the yarn is melting the stainless steel fiber will still withstand the temperatures and it will melt at a much higher melting point, e.g. 1500°C , thus with a significant delay compared to the melting point of the yarn.

Thrash in combination with Saito does not disclose or remotely suggest a carrier strip connected to the detector track and consisting of a material which under the local effect of an arc originating from one of the at least one inner conductor irreversibly changes its shape, thereby exerting mechanical forces acting directly on the detector track which interrupt said detector track due to the connection of said detector track to said carrier strip, as claimed by Applicants.

Discussion of New Claims 90-93

New claim 90 is based on a combination of claims 86 and 44 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

New claim 91 is based on a combination of claims 86 and 45 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

New claim 92 is based on a combination of claims 86, 44 and 46 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

New claim 93 is based on a combination of claims 86, 45, and 46 and also specifies that the carrier strip consists of a material that contracts under the effect of the arc (see, e.g., Applicants' specification, page 23, third para.).

Neither Thrash nor Saito discloses or suggest a carrier strip that consists of a material that contracts under the local effect of an arc and exerts mechanical forces acting directly on the detector track which interrupt said detector track due to the connection of said detector track to said carrier strip, as claimed in Applicants' new claims 90-93.

In addition, the arguments set forth above with regard to claims 44, 45, 46, and 86 apply equally to the new claims that contain corresponding subject matter.

Applicants respectfully submit that the present invention as set forth in the independent claims would not have been obvious to one skilled in the art in view of Thrash taken in combination with Saito or any of the other prior art of record.

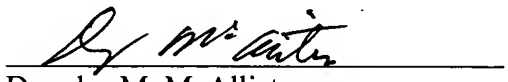
Further remarks regarding the asserted relationship between Applicants' claims and the prior art are not deemed necessary, in view of the amended claims and the foregoing discussion. Applicants' silence as to any of the Examiner's comments is not indicative of an acquiescence to the stated grounds of rejection.

Withdrawal of the rejections under 35 U.S.C. § 103(a) is therefore respectfully requested.

Conclusion

The Examiner is respectfully requested to reconsider this application, allow each of the pending claims and to pass this application on to an early issue. If there are any remaining issues that need to be addressed in order to place this application into condition for allowance, the Examiner is requested to telephone Applicants' undersigned attorney.

Respectfully submitted,



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